REMARKS

Entry of the Amendment and favorable reconsideration of the application is respectfully requested in light of the amendment and the following detailed discussion. Claims 1 and 45 have been amended in a manner intended simply to clarify the original claim language, and have not been narrowed in scope. Support for the amendments can be found, for example, at page 6 lines 9-12 and page 7 lines 8-11. Claims 2-16 and 19-40 have previously been withdrawn from consideration and cancelled. Claims 1, 17, 18 and 41-48 remain pending in the application.

Claim 48, newly submitted in the previous response, has been withdrawn from consideration. In this regard, the Examiner has taken the position that claim 48 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the invention now claimed, algicidal, has not been presented or examined, and requires a new search as a patentably distinct and independent invention. Since applicants have received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 48 stands withdrawn from consideration as being directed to a non-elected invention.

Applicants respectfully traverse the withdrawal of claim 48 as being directed to a non-elected invention. Claim 48 defines "The article of claim 42 wherein the substrate is a roofing shingle, roofing granules, tile, concrete, or metal, and wherein the polymeric composition is effective against algae from roofing shingles." Claim 42, in turn, defines "An article comprising a substrate coated with the polymeric composition of claim 1." Finally, claim 1 defines "A polymeric composition, comprising, a polyurethane polymer derived from a polyisocyanate compound and a polyactive hydrogen compound, said polyurethane polymer at least partially endcapped at a terminal position with a group including at least one antimicrobial quaternary ammonium group, said polymeric composition capable of forming a self supporting film."

In the September 14, 2001 response to the original election requirement, applicants elected "polyurethanes terminated in monol vinylic compounds which are additionally polymerized with antimicrobial vinylic monomers. The noted species is represented by examples 1, 4, 7, 8 and 9 and claims 1, 17 and 18." At least examples 1 and 8 are shown in the application to have algicidal properties. Moreover, "biocidal" and "antimicrobial" are noted at page 4 of the

specification to "refer to the ability of any composition contemplated by the invention to inhibit the growth of or to kill microorganisms such as without limitation bacteria, fungi, mildew, mold, and algae."

For these reasons, the invention defines by claim 48 was properly presented and is not directed to a "non-elected invention." Reconsideration of claim 48 is therefore requested.

§ 112 Rejections

Applicants note with appreciation that the previous rejections under 35 U.S.C. § 112, first paragraph, have been withdrawn.

§ 102 Rejections

I. Claims 1, 41-44 stand rejected under 35 U.S.C. § 102(b) as purportedly being anticipated by Wang et al. '98.

The Examiner has previously stated that Wang describes "self-supporting" films "partially endcapped" with a quaternary antimicrobial group that is pendant to the structure, and that Wang describes a polymer composition useful to treat solids (fibers), articles (coated fabrics) for medical use, aqueous dispersions to provide films, and coated fabrics. In response to the arguments previously submitted by applicants, the Examiner has simply stated that Wang "shows a polyurethane with branches, within the instant claim language, capped." Office Action page 4.

As noted, Wang describes a polyurethane prepolymer that is chain-extended with diethylenetriamine to form a polyurethane polymer (see Abstract). Wang then grafts epichlorohydrin onto the polyurethane polymer to form a "reactive polyurethane solution" (see equations on page 178). It is this pendant epichlorohydrin that is then reacted with the biocide (see equation on page 179). Contrary to the Examiner's assertion, the equation on page 179 does not show a polyurethane polymer **endcapped** with a quaternary ammonium group. Rather, Wang clearly shows and describes a polyurethane polymer having epichlorohydrin bonded to the polyurethane backbone, with the biocide bonded to the epichlorohydrin.

Although being "endcapped" already indicates that the group is at a terminal position on the polyurethane polymer, claim 1 has been amended to explicitly require that the polyurethane

polymer is at least partially endcapped at a terminal position with a group including at least one antimicrobial quaternary ammonium group.

Thus, in contrast to Wang, claim 1 requires, *inter alia*, a polyurethane polymer "at least partially endcapped at a terminal position with a group including at least one antimicrobial quaternary ammonium group" (claim 1). That is, the main chain of the polyurethane polymer **itself** is endcapped in the invention defined by claim 1.

The "polyurethane with branches .... capped" in the manner described by Wang is simply not "at least partially endcapped at a terminal position with a group including at least one antimicrobial quaternary ammonium group." Thus, it has not been shown that Wang describes each and every element of the present invention in as complete detail as is contained in claim 1. The rejection of claims 1 and 41-44 under 35 U.S.C. § 102(b) as purportedly being anticipated by Wang is therefore unwarranted and should be withdrawn.

II. Claims 1 and 41-45 stand rejected under 35 U.S.C. § 102(b) as purportedly being anticipated by Stovicek (5,084,096).

The Examiner has previously indicated that the Stovicek claims describe a polyurethane treated with quaternary biocidal end groups to provide films, coatings, and articles. The Examiner has also stated that an alkylene group attached the quaternary moiety to the polymer chain citing col. 2 and example 4. In response to the arguments previously submitted by applicants, the Examiner simply stated that Stovicek was "within language addressed to the instant polyurethane end capped."

Referring to claims 1 and 45, it is important to note that Stovicek describes the resins as having "directly bonded to their backbone repeating side chains of an active microbiocidal quaternary ammonium radical." Similarly, the general formula in col. 2 of Stovicek illustrates a pendant chain directly bonded to the polymer backbone at an intermediate position, and Example 4 of Stovicek (specifically referred to by the Examiner in the previous Office Action) describes epoxies, not the polyurethane polymers claimed by applicants. Thus, Stovicek clearly requires the bonding of active microbiocidal quaternary ammonium radical directly to the polymer backbone in an intermediate position. As discussed above with regard to Wang, this does not fulfill the antimicrobial endcapped polyurethane polymer requirement of claim 1 of the present invention.

Applicants are unable to find any description in Stovicek of a polyurethane polymer at least partially endcapped at a terminal position with a group including at least one antimicrobial quaternary ammonium group, and the Examiner does not even argue that such structure is disclosed in Stovicek.

As Stovicek does not describe each and every element, it does not anticipate the invention defined in claims 1 and 45. Thus, the rejection of claims 1 and 41-45 under 35 U.S.C. § 102(b) as purportedly being anticipated by Stovicek is unwarranted and should be withdrawn.

§ 103 Rejections

Claims 1, 17, 18, 41-47 stand rejected under 35 U.S.C. § 103(a) as purportedly being unpatentable over Klesse et al. (6,194,530) in view of Stovicek and further in view of Imazato et al. (5,408,022) and Green et al. (3,931,319).

The Examiner has taken the position that the instant composition, capable of forming a self-supporting film, does not further define the basis for this capability, how formed, thickness and meaning of film and self supporting, and is obvious to one of ordinary skill in the antimicrobial coating arts. It is asserted that all of the references are in this art- and treat coating the instant substrates, medic and hygiene articles, cloth, fibers, exterior surfaces to provide self supporting films, such as the painted surfaces and articles of Klesse (col.9, last paragraph), the metal concrete exterior of Stovicek (claims), the medical articles of Imazato (col.7, top) and general use of quaternary end capping of Green.

With regard to Klesse, it is said that (b) of col. 2 teaches repeated urethane groups-polyurethane, to stretch the not otherwise limited instant polymers to which are attached vinyl linking and quaternary pendant groups, which would, "to some degree" constitute end groups during polymerization. Stovicek is said to carry the process further; the polymer, elucidating polymers of polyurethane, the side chain considered as a capped termination-the polymer thus partially end capped, as of instant claim 1.

Imazato is likewise said to show treatment of polyurethane, as instantly claimed, with quaternary attachable end groups, and Green suggests any polymer can be end capped with quaternary microbiocidal groups.

With regard to the previous arguments submitted by the applicants, the Examiner responds that "Applicants' arguments to the point that each of the references fail to identify the instant claimed features, and absent a showing to combine, is not persuasive. There is no preclusion of one in the art to utilize the subject matter of the cited references and provide a polyurethane, among other polymeric options shown, with at least partial end capping with Green's showing that polymers end capped with quaternary groups are biocidal."

Of course, the fact that "there is no preclusion of one in the art" is not sufficient to provide a *prima facie* case of obviousness. Rather, the consistent criterion for a determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art the claimed invention and that it would have had a reasonable likelihood of success, viewed in the light of the prior art. *In re Dow Chemical Co.*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988).

The Examiner has previously acknowledged that Klesse does not describe, teach, or suggest polyurethane polymers. Claim 1 requires, *inter alia*, a polyurethane polymer derived from a polyisocyanate compound and a polyactive hydrogen compound, which is defined as a polyfunctional compound having more than one active hydrogen moiety capable of a reaction with an isocyanate moiety. Klesse does not describe the claimed polyurethane polymer. As importantly, and as further acknowledged by the Examiner's argument, Klesse does not teach the quaternary ammonium as an end group, or at a terminal position. Thus, Klesse can hardly be said to disclose the essence of the claimed invention.

The Examiner's previous arguments had added Stovicek for its disclosure of quaternary compounds as biocidally effective in polymers. As discussed above, Stovicek also lacks any description of a polyurethane polymer at least partially endcapped at a terminal position with a group including at least one antimicrobial quaternary ammonium group. Thus, the combination of Klesse and Stovicek lacks the required polyurethane polymer at least partially endcapped in a terminal position with a quaternary ammonium group.

Imazato had been relied upon for its teaching of a vinyl in urethane polymerization, citing col. 7 line 66 through line 63 of col. 8. However, Imazato describes only "urethane(meth)acrylic acid" and "urethane(meth)acrylates" in col. 7, not polyurethane polymers. Further, Imazato describes reacting a diisocyanate with a methacrylate having a hydroxyl group to form a "tri- or more functional monomer" (col. 8 lines 41-60). The Examiner's argument does not show how this

provides the polyactive hydrogen compound or the polyurethane polymer required by the present invention. This combination still fails to show the required polyurethane polymer at least partially endcapped at a terminal position with a quaternary ammonium as required in all claims of the present invention.

Green is cited for teaching capping of a polymer with a quaternary ammonium moiety (see Previous Office Action p. 5). As discussed previously, Green is directed to linear quaternary ammonium polymers (see col. 1 lines 4-8). The Green chemistry involves reacting a dihaloalkene (*e.g.*, 1,4-dichloro-2-butene) with a difunctional tertiary amine to extend the chains and a monofunctional tertiary amine to end the chains (see col. 1 line 67—col. 2 line 7). Thus, "the quaternary ammonium moieties are part of the linear polymeric chain" (col. 1 lines 5-7). The Examiner's provides not basis for any motivation or suggestion in Green to endcap a polyurethane polymer. As with the other references, Green fails to show the required polyurethane polymer at least partially endcapped at a terminal position with a quaternary ammonium group.

The Examiner's argument does not show any likelihood of success in combining these chemistries and thus provides no reasonable expectation of success in reaching the claimed invention. An attempt is made to combine selections from the free radical polymerization methods of Klesse and Imazato for non-polyurethane polymers with the stepwise polymerization of Stovicek, and then somehow add the Green tertiary amine polymerization followed by chain termination.

The Examiner's argument lacks any suggestion in the art to combine selected features from different chemistries in the manner defined by applicants' claims. Absent a showing of a suggestion to combine in the prior art, the applicants' teaching has been impermissibly used to hunt through the prior art for the claimed elements and combine them as claimed. *In re Laskowski*, 10 USPQ 2d 1397, 1398 (Fed. Cir. 1989). These references are devoid of any suggestion of the advantages of providing a polyurethane polymer endcapped with a quaternary ammonium group. The only source of the noted advantages of the claimed polyurethane polymer is *applicants' specification*, and it is improper to use this as the purported motivation for combining the references. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Finally, even if was proper to combine particular features from these four references, the resulting combination would not be a polyurethane polymer, as defined by claim 1. To the extent one might guess how these references could be combined, the result would at best be the non-polyurethane polymer of Klesse terminating in the quaternary ammonium moieties of Green. Such a combination still lacks a polyurethane polymer derived from a polyisocyanate compound and a polyactive hydrogen compound at least partially endcapped at a terminal position with a quaternary ammonium group.

Moreover, the term "self-supporting film" is in fact defined, for example at page 11 of the specification, as meaning "that when the composition is dried down onto a release liner of suitably low surface energy, the film so formed once removed from the release liner is capable of supporting its own weight." The Examiner has not offered how the "painted surfaces and articles of Klesse (col.9, last paragraph), the metal concrete exterior of Stovicek (claims), the medical articles of Imazato (col.7, top) and general use of quaternary end capping of Green," might meet this definition.

For all of these reasons, the rejection of the claims under 35 U.S.C. § 103 as purportedly being unpatentable over Klesse in view of Stovicek and further in view of Imazato and Green is unwarranted and should be withdrawn.

In view of the above, it is submitted that the application is in condition for allowance. Entry of the amendments and reconsideration of the application is requested.

Respectfully submitted,

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